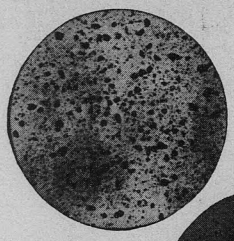
APR 19 1934

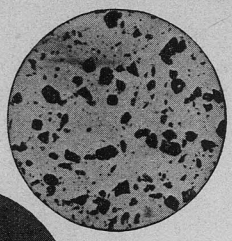
The Maryland Fruit Grower

April, 1934

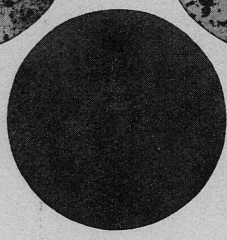
Maryland State
Horticultural Society



Ground Sulphur Dust—Magnified 100 times. Compare the large size of these particles with those of Koppers Flotation Sulphur.



Commercial Precipitated Sulphur Flakes—Magnified 100 times. Particles as large as these are almost useless to orchardists for spraying.



Koppers Flotation Sulphur—(Paste and Dry Wettable) Magnified 100 times. Notice that the particles are many times smaller than those in ordinary sulphurs.

Here's what the Ultra-Fineness of KOPPERS FLOTATION SULPHUR *means to the Grower*

1. Surer, Safer Protection
2. Maximum Coverage with Minimum Amount of Spray
3. Better adherence to foliage and fruit
4. More uniform deposit
5. Does not mar or blotch matured fruit
6. Sprays more easily
7. Finer finish to the fruit

The Original and Genuine Flotation Sulphur carries the Koppers Name and this trade mark. Look for it always.

KOPPERS
FLOTATION SULPHUR

KOPPERS PRODUCTS COMPANY

KOPPERS BUILDING PITTSBURGH, PA.

You can be sure of fine fruit when you spray with Koppers Flotation Sulphur

The Maryland Fruit Grower

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Edited by the Secretary, A. F. Vierheller, Extension Horticulturist

Vol. 4 **April, 1934** **No. 4**

POLLINATION OF APPLES

S. W. WENTWORTH
Department of Horticulture, University of Maryland

(Continued from March Issue)

TOMPKINS KING
Delicious, Golden Russet, Jonathan, McIntosh, Wagener, Wealthy, Yellow Bellflower.

TWENTY OUNCE
Esopus, McIntosh.

TURLEY
Delicious, Jonathan.

WAGENER
Ben Davis, Delicious, Esopus, Gravenstein, Grimes, Jonathan, *McIntosh,* Rhode Island, *Rome Beauty,* Tompkins King, York Imperial.

WILLIAMS
Ben Davis, Early Ripe, *Golden Delicious,* Grimes, Red Astrachan, Red Duchess, *Red Rome, Rome Beauty, Starking,* Wilson Red June, *Wealthy,* Yellow Transparent.
Jonathan is not satisfactory.

WILSON RED JUNE
Delicious, Golden Delicious, McIntosh, Melba, Patten Greening, Starking, Yellow Transparent.

WINTER BANANA
Pollination work on this variety has been very unsatisfactory.

WINESAP
Arkansas Black, *Ben Davis, Black Ben,* Blackjon, *Delicious,* Esopus, *Golden Delicious, Grimes, Jonathan,* King David, King John, *McIntosh,* Northern Spy. Red Canada, *Red Rome, Richared, Rome Beauty,* Red June, Starking, Shotwell Delicious, White Winter Pearmain, *Winter Banana, Yellow Newtown,* Yellow Transparent, *York Imperial.*
Arkansas, Kinnaird and Stayman are cross unfruitful with Winesap.

YELLOW BELLFLOWER
Delicious, Gravenstein, Red Canada, Yellow Newtown.
Tompkins King, Esopus, and Rhode Island are unsatisfactory.

YELLOW NEWTOWN
Ben Davis, Delicious, Esopus, Grimes, *Jonathan,* Red Pearmain, White Pippin, *White Winter Pearmain,* White Bellflower, *Yellow Bellflower.*
Yellow Newtown often sets a commercial crop with its own pollen.

YELLOW TRANSPARENT
Ben Davis, *Delicious,* Early Ripe, *Jonathan,* Nero, Nickajack, *Oldenburg,* Oliver, Red Astrachan, Red June, Williams, *Wealthy.*

YORK IMPERIAL
Ben Davis, *Delicious,* Grimes, Joyce, *Jonathan,* Melba, Missouri Pippin, Northwestern, *Rome Beauty,* Red Duchess, *Red Rome, Starking,* Wagener, Wealthy.

THE RELATION OF VIGOR OF SPURS AND SET OF FRUIT

Very weak spurs will not set fruit regardless of the potency of the pollen used. The best set of fruit is found on spurs which have made the most growth during the previous season and are vigorous from the standpoint of diameter, length, number of leaves, and size of leaves. Pruning, cultivating, applications of nitrogen fertilizers, and spraying to control insects and diseases will improve the vigor of the spurs and the set of fruit.

THE EFFECT OF WEATHER ON THE SET OF FRUIT

Cold weather just previous to the bloom period may injure a large percentage of the ovules and pistils. Under these conditions the flowers may open but are incapable of setting fruit with *any* pollen. The pollen also may be destroyed at this time. Frost injury may occur after the flowers are in bloom or immediately after the petals are shed. Prolonged cool, rainy, cloudy or windy weather during the bloom period prevents or inhibits the flight of bees and other pollen-carrying insects and thus causes a poor set of fruit. Bees and other pollen-carrying insects are not very effective in the distribution of pollen below a temperature of 65 degrees F. Cool weather also slows up pollen tube growth and delays or prevents fertilization of the ovules. If weather conditions are favorable and pollen and pollen-carrying insects are abundant, a thorough job of pollination can be done during a very short period; probably in less than one hour. If weather conditions are ideal and pollen-carrying insects abundant, self-unfruitful varieties set in large blocks may become well pollinated even though the source of the pollen is not near by. Such an orchard will not set well during the unfavorable seasons, however, when a good crop is most desirable. Wind apparently is not an important agent in the distribution of pollen in apple orchards.

DISTRIBUTION OF VARIETIES AND BEES IN THE ORCHARD

Since most of our apple varieties will not set a commercial crop with their own pollen, it is necessary that two or more varieties be interplanted in the same orchard. In localities where weather conditions are poor during the bloom period, self-unfruitful varieties should not be set in blocks more than two rows wide with one, or preferably two rows of the pollenizing variety adjacent. With weather conditions very favorable, self-unfruitful varieties in blocks three or four rows wide, with two rows of the pollenizer adjacent, seems to be the limit that can be recommended. In both cases bees should be provided at the rate of about one good colony per acre. With partially self-fruitful varieties the blocks can be one or two rows wider as a rule. With certain varieties such as the Baldwin and Yellow Transparent there may be a tendency toward over-pollination and excessive production which may result in pronounced biennial bearing. These two varieties will probably have a greater tendency to bear annually if the trees are set in

SPRAY INJURY

According to Professor M. A. Blake, of New Jersey, the leaves and fruits of weak trees or trees low in nitrogen are more susceptible to spray injury than are trees bearing healthy foliage. This may apply to the opening buds at delayed dormant spraying and beyond petal fall. Professor Blake states that even trees well supplied with nitrogen and on fertile soil may be low in nitrogen in the leaves because low temperature may prevent the free transfer of assimilated nitrogen from the roots to the leaves.

The suggested remedies are to avoid the use of too caustic materials in the early sprays on varieties that burn easily or on weak blocks of trees. It is very easy to burn foliage, no matter how careful we may be. We can't blow the bugs and insects off the trees by high pressure, but must rely on good pressure and proper disks to give us a fog or mist spray with good coverage.

To Kill Codling Moth Worms - - -
Cut wormy fruit losses 75%

This year, take this protection against codling moth. Band all apple trees with Beta Naphthol bands. Kill the moth worms your spraying fails to get. Beta Naphthol bands kill 100% of the worms that enter them. As many as 1300 dead worms have been found in a single 2-inch band.

Orchards protected by Beta Naphthol tree banding show 75% less wormy fruit loss than neighboring orchards where only sprays are used. And the cost of banding is only a few cents per tree.

American Cyanamid & Chemical Corporation does not make tree bands. But we supply Beta Naphthol to reputable manufacturers in every apple section who sell finished tree bands made of corrugated paper impregnated with Beta Naphthol. Recommended by U. S. Department of Agriculture and State Experiment Stations.

Speak to your State Experiment Station about the size band recommended for your locality. And arrange with your local band manufacturer for a supply of Beta Naphthol Tree Bands.

Write for descriptive leaflet and name of nearest tree band manufacturer.

AMERICAN CYANAMID & CHEMICAL CORP.
Insecticide Division
30 Rockefeller Plaza, New York, N. Y.

Beta Naphthol *for* **TREE BANDS**

PRODUCING A CLEAN CROP

HARRY W. MILLER
Paw Paw, W. Va.

As the production of a good apple crop is not the work of a single year we must do like the old saying, "To make an honest man begin with his grandfather." Take a look at the soil, tree, spraying and other management in previous years. In our case the orchards which made a clean crop last year have had about 15 cover crops in the past, and we have in a large measure followed the Pennsylvania 25-year experiment, in that we have in the last 5 or 6 years cultivated our orchards part of the time and part of the time we have left them in a clover or other legume sod. Twenty-five years ago our peach and apple growers used the "dust mulch" system and would boast that you could not see a weed on an acre. This system we have entirely abandoned and now we cut the sod up every 2 or 3 years and use only enough cultivation to keep the weeds down, with no thought of mulching with anything but green cover crops and sod. The trouble with the "dust mulch" is that when a thunder shower comes along we find the best of our soil washed off and down into the river where it never can be brought back. Recently we have noticed that 4 different experiment stations advise abandoning the "dust mulch" system on account of loss by erosion. The quickest way to make our hill land poor is to let it wash away or plow it wet. We have also found that while the soil and tree should be fed year after year in order to make continuous crops, it is also essential to feed the crop with complete fertilizers through the whole crop year. With this end in view we applied a 4-16-4 fertilizer broadcast all over the orchard early in March, and in April we applied 2 pounds per tree of Nitrate of Soda and later in June made another application of like amount and the first week in September we applied 2 pounds of Nitrate. The aim of this last application being to hold the foliage and fruit on the tree until full color and maturity were obtained. In broadcasting fertilizer it is a good practice to walk with the right hand to the tree and cast outward as wide as possible. This applies the fertilizer from 4 to 12 feet from the body of the tree which encourages the feeder roots to come to the surface a considerable distance from the base of the tree. After following this plan for a number of years, we were very agreeably surprised to find at the field meeting of the Maryland Horticultural Society last summer that they had worked out a chart showing the same results we had gotten in field practice. We believe this matter of soil culture and tree feeding all through the crop year should be given serious attention by our Experiment Stations. We cannot give the tree breakfast and let it go with no dinner or supper. Many orchards this season lost their foliage a month too soon. This makes the tree take its rest too soon and is likely to cause it to bloom too early next spring. This condition will be shown later to have come either from soil exhaustion or from tree exhaustion by lack of proper spraying and nourishment of the tree at the proper time. Our orchards are well equipped with pipe systems and when the wet weather came last spring we kept our pressure up to 500 pounds from 5 o'clock in the morning until 8 o'clock at night and used every hour that the trees were dry enough, to cover up both the young fruit and new growth. We had previously sprayed with oil emulsion for scale and cresylic acid for aphis. This spray was applied as late as possible just before the pink stage of blooming and good results were obtained both for scale and aphis. To get the best results, 5 points are

essential to effective spraying.

(1) Proper pruning so the material can be applied to every part of the tree.
(2) The right material properly mixed.
(3) Timely application.
(4) Plenty of material applied to cover every part of every tree in the block.
(5) Enough equipment to meet all emergencies.

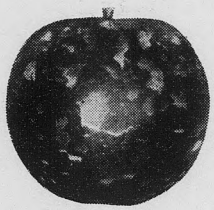
Our mixing being all done at the central plant enables us to test every tank with the hydrometer. Another point is to see that the agitator is running fast enough to always keep the materials in suspension and that every part of it goes into solution. As to the time of application, it is better to start one or two days ahead rather than late, in order to have the machinery working well.

Spraying From Tree Center

We instruct our gunners to step into the center of the tree and spray straight up through the tops. This throws a fog out through and over the top of the tree and we further have our gunners to spray up and down around the tree and not horizontally. This covers top and bottom alike whereas spraying horizontally around the tree covers the first 10 feet from the ground but often does not cover the top. We insist on our gunners spraying clear over the top of the trees from all four sides and also instruct our hose drag-

COMPLETE CODLING MOTH CONTROL
with 80 PLUS micrograms of arsenic per square inch for users of SHERWIN-WILLIAMS

ARSENATE OF LEAD



Note even deposit obtained by using S-W Arsenate of Lead alone, 2 pounds to 100 gallons. 1 calyx and 4 cover sprays.

Micrograms As $_2O_3$/sq. in.

	After Spray'g	Weathered 5 wks.
Top	90	46
Bottom	80	40
AVERAGE	85	43

It takes 80 PLUS micrograms of arsenic per square inch to control codling moth. Eighty micrograms of killing power evenly distributed over every square inch to kill larvae and reduce stings to a minimum.

Spray your apples with Sherwin-Williams Arsenate of Lead in 1934 . . . for best control, leading entomologists in this state recommend one gallon of diluted Arsenate of Lead spray for each bushel of apples on a tree.

Use This FREE Codling Moth Control Service

Our Spraying Service offers a new practical plan for better codling moth control. It tells you how and when to spray, how to trap codling moths and band your tree to catch the worms. For the latest information on codling moth control, write

—to—

Insecticide Department
THE SHERWIN-WILLIAMS CO.
101 Prospect Avenue Cleveland, Ohio

SHERWIN-WILLIAMS
SPRAY AND DUST MATERIALS

gers to notify the gunner if any part of the tree is not sprayed before leaving it. As each man works on a separate line we have our field foreman climb the trees behind each sprayer and see if he is doing a thorough job. It is wise to keep a mechanic on the job so that all guns and side lines have the same pressure. It is poor economy to spray with machinery out of order as it wastes both the material and time of the operator. We used arsenate of lead in the pink petal fall, and two weeks spray, and used calcium arsenate and bordeaux in other sprays, applying the last spray July 15th to 20th. We make our own lime-sulphur at a cost of approximately $2.40 per barrel. This enables us to use plenty of material without too much cost. In order to make lime-sulphur successfully it is very essential to have good lime and good sulphur.

One serious mistake many growers make in spraying is to cover the full trees well and slight those with light crops. This gives the worms a chance to eat up all the crop on the light trees and leaves the grower no chance to thin off the defective fruit as in the case of the full trees. Sprays every tree thoroughly in each block whether carrying a crop or not. In thinning we generally carry a small sack and drop all wormy apples in it. These apples are either boiled or roasted on a brush pile which destroys all the worms. Thinning is now an essential part of raising a good crop of apples. We issue the following instructions for this work:

"The purpose of thinning is to relieve the trees of all excess load and space the fruit so that it will color and size properly.

"To do this, first, thin off all imperfect fruit including aphis injury. Then take off all doubles necessary to space properly. Thin fruit out from underneath including all undersize fruit leaving the tree so it carries its load with the best fruit out where it can get sun and air.

"In thinning use both hands and if possible break the stem off at the apples and leave it on the tree. Where the apples are closely bunched take the little ones and leave the big fruit with the best color out to the sun.

"Do not break off the fruit spurs as they are needed for next year. Leave fruit, if possible, where the leaves have not been injured by aphis.

"Space as follows: all summer fruit at least 6 inches apart, Grimes Golden 8 to 10 inches, Stayman Winesap and Delicious 8 to 12 inches. Where trees of these three varieties show drought injury pull the small ones and space to 10 inches apart. Space York Imperial and other winter varieties to 5 or 6 inches apart.

"Where trees have one limb or one side showing bad drought injury saw out the dead limbs and if necessary shear back to good wood over the top.

"Foremen will see that all dead and broken limbs are cut out of trees as they go along. Pull all water sprouts.

"Thinning is a costly job and we ask the hearty cooperation of all our employees to speed it up as much as possible and yet do thorough work."

As the making of an apple crop requires a heavy cash outlay it is absolutely essential to invest the money where it will bring the largest returns. With this end in view we cut down 2,000 trees the past year which were found to be of uncertain value. In our section the following varieties are of doubtful value as money makers: Duchess, Summer Hegloe, Lowell, Buckingham and Black Twig. Yellow Transparent should be raised on trees not more than 20 years old, as after that age it is hard to get good size. We have found, however,

that an extra application of nitrate about May 15th with early cultivation is a great help in getting early size on this variety.

After getting a clean crop on the trees it is absolutely essential to pick and pack the crop with the utmost care, as the whole investment is then in the crop. Any careless handling in harvesting can defeat the year's work. Below is a list of our picking rules which are issued to all foremen and pickers:

"Employees will pick fruit as directed, green or ripe, large or small.

"Pickers will carry bags on side, not in front.

"Do not lay down on fruit while on ladders.

"In emptying sacks see that fruit is put down to bottom of barrel or box before pouring out.

"Do not throw fruit in sacks as this causes stem punctures and bruising. Picked fruit must be set in the shade on North side of trees.

"Use extra care in handling Winter Banana, Grimes Golden, Delicious, Stayman's Winesap and other tender varieties. Set ladders up straight so as not to knock off fruit.

"We ask the hearty cooperation of all our employees to help us pick and pack the fruit with the utmost care. We cannot pay good wages for an inferior output. Nothing but good fruit in good condition can be sold this season. Help us and we will help you."

For packing fruit we find that the use of a good brusher is essential to remove residue and bring out the proper lustre and color of the fruit. Below is a copy of our packing house regulations:

"Fruit stacked in boxes must not be high enough to be bruised.

"Use trucks to move apples. Do not roll full barrels on the bulge. Roll on chine.

"DUMPERS will see that no apples drop more than TWO (2) inches on feeding belt.

"ROLL OPERATORS and FACE PICKERS will not throw apples into baskets.

"Keep all containers close so that no fruit is dropped more than TWO (2) inches.

"FACERS will put baskets down to bottom of barrel before emptying. Put in tight faces and see that all nails are driven down in barrels, before facing.

"RUNNERS will see that aprons are let down to bottom of barrels, before releasing fruit.

"Shake each barrel 2 times below bulge and 2 times above bulge for DOMESTIC PACK. Shake 3 times below bulge and 3 times above bulge for FOREIGN PACK.

"Use a moderate 'raise' in ring tailing.

"See that apples are not pressed too light.

"Nails must go into heads and not below.

"See that all stamps and labels are put on straight and neat."

When all is said and done the human element is the largest factor in growing and harvesting a crop. We pay our men according to their skill and the results they get and believe it is good investment. Our success in 1933 is in a large measure due to the hearty cooperation and personal interest which our employees have taken in every phase of our work, which has made it possible for us to produce a good crop under very trying conditions, and we hereby extend to them our sincere thanks and trust that our future relations may always be mutually as cordial and friendly as they have been during the past year.

THE PEACH SITUATION

There is not a lot of change in the reports of bud injury of peach from the effects of the severe freezes in February, except that some additional reports from Tennessee and Illinois have added more territory to the damaged areas. Some Maryland growers are encouraged by finding more buds that look good, and there may be more peaches on some varieties than we expected. We'll know more at shuck fall. So far very little serious wood injury has been seen in Maryland, but probably there is some such injury. A few of the other states report severe wood injury.

A bill has been introduced in Congress by Senator H. F. Kean, of New Jersey (Resolution S. J. 89) providing for a relief fund for peach growers, following the storm damage of last year and the freeze of this winter. Under this bill, ten million dollars would be set aside for loans to peach growers at a low rate of interest. No grower could borrow over five thousand dollars, nor over fifty dollars per acre of peaches. The loan would bear no interest for 2 years, and the borrower would pay at least 25% of the loan the third year, 35% the fourth year and the remainder, or 40% the fifth year. The idea of the bill is to help the grower to carry the orchard until the 1935 crop.

'AERO' CYANAMID
A SUPERIOR FRUIT
FERTILIZER

USE
Granular
'AERO'
CYANAMID

You'll be pleased with the improved vigor and the increased yields.

BECAUSE—

It feeds trees evenly throughout season
It grows large dark-green leaves
It holds leaves on entire summer
It produces good set of fruit and fruit buds
It improves color of fruit
It increases yield

and Because—

It is the only nitrogen fertilizer that carries hydrated lime to sweeten the soil.

AMERICAN CYANAMID CO.
30 Rockefeller Plaza
New York, N. Y.

TWO THOUGHTS

Commercial concerns handling orchard supplies have had their losses along with the rest of the business world. But they still have confidence in the orchard industry and faith in their own products. They are spending time and money in advertising. Their advertising helps in keeping the Horticultural Society publications going. Do you read the ads carefully? Remember our advertisers when you need materials. It is only fair to patronize those who give us their patronage.

The secretary cannot see every fruit grower in Maryland. We need more paid-up members. A Horticultural Society can be no stronger than its paid-up membership. Just put your dollar, name and address in an envelope and mail it to the Secretary. Do it now. Tell your neighbor about the society.

HAVE YOU READ THE ADVERTISEMENTS?

"No More Big Scab and Codling Moth *Losses*!"

"*My trees get the Complete* ORTHO Summer Spray Program . . ."

IN these various ORTHO sprays and suggested combinations you have a Complete Summer Program for control of Scab, Codling Moth, and most all Insect Pests and Diseases.

ORTHOL-K *and Lead Arsenate* with ORTHO Spreader affords the most effective known control for Codling Moth. The Oil Spray kills the eggs, reduces "stings," and makes entrance of the worm much more difficult.

ORTHOL-K *combined with Nicotine Sulphate* is generally acknowledged to be the most effective, economical, and satisfactory substitute for Lead Arsenate in control of Codling Moth. At the same time it is an excellent clean-up spray for Red Mite, Scale, Aphids, Leaf Hoppers, Case Bearers, etc., and ends the problem of residue removal.

COPOSIL...a new colloidal copper fungicide...is rated by outstanding pathologists as remarkably safe and even more effective than Bordeaux in control of Scab, Brooks' Fruit Spot, Blotch, and similar diseases. Mixes readily with the ORTHOL-K and Lead Arsenate or Nicotine Sulphate combination.

ORTHO SPREADER is the latest development in film-building materials for use with Arsenical, Sulphur-Arsenical, Lime-Sulphur, Bordeaux and other Copper Sprays, and the Lead-Arsenate-Oil combination.

Write for full information on the ORTHO *Summer Spray Program*

California Spray-Chemical Corp.
214-AA West 14th Street, New York
15-AA Shattuck Sq., Berkeley, Calif.

ORTHOL-K

ORTHO
SCIENTIFIC PEST CONTROL

AND LEAD ARSENATE with ORTHO SPREADER

(and 'Coposil' for Scab and Brooks' Fruit Spot)

SUMMER SCALECIDE

For Summer Oil - Lead, Summer Oil - Nicotine and other combinations

Summer Scalecide is in a class by itself as a summer oil. It has four distinct advantages over the water white petroleum oil emulsions.

First: Summer Scalecide may be used within 24 hours of lime sulfur or any other sulfur spray. It even combines with some sulfur sprays such as Sulfocide.

Second: Summer Scalecide has been found not only compatible with nicotine for oil nicotine sprays, but is actually a very superior activator.

Third: Summer Scalecide is the ideal summer oil for use with arsenate of lead. It not only increases the codling moth kill, but does not leave a greasy residue to gum up the brushes of the packing house machinery.

Fourth: Summer Scalecide is lower in cost than almost any other summer oil, regardless of the quantity used.

For your 1934 sprays insist on Summer Scalecide. Use Summer Scalecide in combination sprays for the control of codling moth, aphis, leaf hopper, bag worm, case bearer, red mite, scale, etc. Summer Scalecide is just as superior in its class as Scalecide has been for thirty years and it is inexpensive.

Write Department "F" for prices and descriptive leaflet on Summer Scalecide.

B. G. PRATT CO.

50 Church St. New York, N. Y.